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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/060,398	02/01/2002	Takao Inoue	PU01-01115	9587

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EXAMINER
ANYASO, UCHENDU O

ART UNIT	PAPER NUMBER
2675	

DATE MAILED: 11/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/060,398	INOUE, TAKAO	
	Examiner	**Art Unit**	
	Uchendu O Anyaso	2675	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 July 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 6-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 2 and 6-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. **Claims 1, 2** and **6-26** are pending in this action.

Claim Rejections - 35 USC ' 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. **Claims 6 and 7** are rejected under 35 U.S.C. 102(b) as being anticipated by *Kanbar* (U.S. 5,850,126).

Regarding **independent claim 6**, and for **claim 7**, Kanbar teaches a light emitting diode (15) driving circuit comprising a luminance controller that approximates the luminance change characteristics of a light emitting diode with the luminance change of a lamp by teaching an LED lamp which includes a regulator to convert the A-C power line voltage to a D-C voltage and a power transistor activated by a pulse generator to apply D-C pulses to a bank of LEDs, all of which are housed in the lamp, whereby the **screw-in LED lamp** is useable as a **replacement** for a screw-in **incandescent lamp** of a given wattage, yet provides a greater light output at a lower wattage (column 2, lines 22-29).

Claim Rejections - 35 USC ' 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. **Claims 1, 2, 8-11, 14-16** and **18-20** are rejected under 35 U.S.C. 103(a) as being unpatentable over *Kanbar* (U.S. 5,850,126) in view of *Hochstein* (U.S. 5,783,909).

Regarding **independent claims 1** and **5**, and for **claims 8-11** and **20,** Kanbar teaches a light emitting diode 15 driving circuit comprising a control pulse generator (23) (figure 4 at 15, 17, 23).

Furthermore, Kanbar teaches a smoothing circuit by teaching a regulator 21 that includes a rectifier, which rectifies the A-C voltage to produce a D-C voltage of the desired magnitude and to maintain this voltage despite fluctuations in the A-C line voltage (column 3, lines 51-56, figure 4 at 21).

Also, Kanbar teaches a driving circuit for generating a driving voltage according to the control voltage and supplying a forward current to the light emitting diode by teaching how the D-C voltage yielded by regulator 21 is applied to the bank of parallel-connected LEDs 15 through a power transistor 22 wherein transistor 22 is activated by a pulse generator 23 operated from regulator 21 such that the pulse generator 23 yields periodic voltage pulses (column 3, lines 57-62, figure 4 at 21-23).

Furthermore, Kanbar teaches how the switching transistor 22 interrupts the forward current of the LEDs 15 in response to the pulse generator 23 (column 4, lines 1-3, figure 4 at 15, 22, 23).

Also, Kanbar teaches how the control pulse would having a variable duty factor by teaching how the voltage pulses that are applied to the LEDs by power transistor 22, are

activated by pulse generator 23, and are within the short duration of say 2 to 10 microseconds, as shown in FIG. 5 (see column 4, lines 12-17, figure 5).

However, Kanbar does not teach a control pulse having a variable duty factor that is adjusted in dependence on the characteristics of the light emitting diode. On the other hand, Hochstein teaches this concept by teaching a circuit for maintaining the luminous intensity of a light emitting diode wherein the control pulse have a variable duty factor (*see* figure 3, column 4, lines 7-17; column 6, lines 3-17) such that pulses of electrical energy are supplied from an adjustable power supply 16 to an LED 12 for establishing electrical current passing through the LED 12; sensing 22,24 a condition proportional to the luminous intensity of the LED 12; and adjusting the electrical energy supplied by the pulses per unit of time to adjust the average of the current passing through the LED 12 to maintain the luminous intensity of the LED 12 at a predetermined level (column 4, lines 19-28, figure 5 at 22).

Thus, it would have been obvious to a person of ordinary skill in the art to combine Kanbar and Hochstein because while Kanbar teaches a light emitting diode (15) driving circuit comprising a control pulse generator (23) (figure 4 at 15, 17, 23), Hochstein teaches how a control pulse having a variable duty factor is adjusted in dependence on the characteristics of the light emitting diode. The motivation for combining these inventions would have been to achieve a robust design that compensates for the diminution of light output from LED signals due to temperature or aging (column 1, lines 9-18; column 2, lines 29-33).

Regarding **claim 2**, in further discussion of claim 1, Hochstein teaches a circuit for maintaining the luminous intensity of a light emitting diode including at least one light emitting diode (LED) for producing a luminous intensity (column 2, lines 5-9).

Also, Hochstein teaches an adjustable power supply 16 that controls the voltage or current passing through a LEDs 12 wherein a variable pulse width modulated power supply 16 is employed such that changing the pulse width or the pulse rate (frequency) as a function of temperature will change the average current through the LED array (column 3, lines 9-18, figure 1 at 12, 16).

Regarding **claim 14**, in further discussion of claim 6, Kanbar teaches a smoothing circuit by teaching a regulator 21 that includes a rectifier, which rectifies the A-C voltage to produce a D-C voltage of the desired magnitude and to maintain this voltage despite fluctuations in the A-C line voltage (column 3, lines 51-56, figure 4 at 21).

Regarding **claim 15**, in further discussion of claim 6, Kanbar teaches how the switching transistor 22 interrupts the forward current of the LEDs 15 in response to the pulse generator 23 (column 4, lines 1-3, figure 4 at 15, 22, 23).

Regarding **claim 16**, in further discussion of claim 6, Kanbar teaches a driving circuit for generating a driving voltage according to the control voltage and supplying a forward current to the light emitting diode by teaching how the D-C voltage yielded by regulator 21 is applied to the bank of parallel-connected LEDs 15 through a power transistor 22 wherein transistor 22 is

activated by a pulse generator 23 operated from regulator 21 such that the pulse generator 23 yields periodic voltage pulses (column 3, lines 57-62, figure 4 at 21-23).

Regarding **claim 18** and **19**, in further discussion of claim 6, Hochstein teaches a circuit for maintaining the luminous intensity of a light emitting diode wherein the control pulse have a variable duty factor (*see* figure 3, column 4, lines 7-17; column 6, lines 3-17).

Regarding **claims 23-25**, in further discussion of claims 1 and 2, Kanbar teaches a driving circuit for generating a driving voltage according to the control voltage and supplying a forward current to the light emitting diode by teaching how the D-C voltage yielded by regulator 21 is applied to the bank of parallel-connected LEDs 15 through a power transistor 22 wherein transistor 22 is activated by a pulse generator 23 operated from regulator 21 such that the pulse generator 23 yields periodic voltage pulses (column 3, lines 57-62, figure 4 at 21-23).

Furthermore, Kanbar teaches how the switching transistor 22 interrupts the forward current of the LEDs 15 in response to the pulse generator 23 (column 4, lines 1-3, figure 4 at 15, 22, 23).

Regarding **claim 26**, in further discussion of claim 2, Hochstein teaches an IC that is driven by a software program (column 5, lines 21-26, figure 1).

6. **Claims 12, 13 and 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over *Kanbar* (U.S. 5,850,126) in view of *Dussureault* (U.S. 6,236,331).

Regarding **claims 12, 13 and 17**, in further discussion of claim 6, Kanbar does not teach a luminance controller comprising a maximum voltage generator that provides a maximum luminance from the light emitting diodes and a minimum voltage generator that prevents sudden luminance decrease by the light emitting diodes. On the other hand, Dussureault teaches an LED traffic light intensity controller comprising a controller that detects the output light intensity of a color, and then automatically adjusts the power input for the LEDs in order to increase the light intensity when needed (see Abstract) thereby maintaining the intensity of the LEDs at desired levels (column 3, lines 21-37).

Thus, it would have been obvious to a person of ordinary skill in the art to combine Kanbar and Dussureault because while Kanbar teaches a light emitting diode (15) driving circuit comprising a control pulse generator (23) (figure 4 at 15, 17, 23), Dussureault teaches an LED traffic light intensity controller comprising a controller that detects the output light intensity of a color, and then automatically adjusts the power input for the LEDs in order to increase the light intensity when needed (see Abstract). The motivation for combining these inventions would have been to maintain the intensity of the LEDs at desired levels (column 3, lines 21-37).

Furthermore, Dussereault teaches an embodiment of his invention wherein the controller 10 comprises a protection fuse 15 whose purpose is to open the circuit when the input current becomes too high (see column 3, lines 66 through column 4, lines 1-17, figure 2 at 15).

6. **Claims 21 and 22** are rejected under 35 U.S.C. 103(a) as being unpatentable over *Kanbar* (U.S. 5,850,126) in view of *Hochstein* (U.S. 5,783,909), as in claim 6 above, and further in view of *Dussureault* (U.S. 6,236,331).

Regarding **claims 21 and 22**, in further discussion of claims 1 and 2, Kanbar and Hochstein do not teach a luminance controller comprising a maximum voltage generator that provides a maximum luminance from the light emitting diodes and a minimum voltage generator that prevents sudden luminance decrease by the light emitting diodes. On the other hand, Dussureault teaches an LED traffic light intensity controller comprising a controller that detects the output light intensity of a color, and then automatically adjusts the power input for the LEDs in order to increase the light intensity when needed (see Abstract) thereby maintaining the intensity of the LEDs at desired levels (column 3, lines 21-37).

Thus, it would have been obvious to a person of ordinary skill in the art to combine Kanbar, Hochstein and Dussureault because while the combination of Kanbar and Hochstein teach a circuit for maintaining the luminous intensity of a light emitting diode comprising a control pulse generator having a variable duty factor, Dussureault teaches an LED traffic light intensity controller comprising a controller that detects the output light intensity of a color, and then automatically adjusts the power input for the LEDs in order to increase the light intensity when needed (see Abstract). The motivation for combining these inventions would have been to maintain the intensity of the LEDs at desired levels (column 3, lines 21-37).

Furthermore, Dussereault teaches an embodiment of his invention wherein the controller 10 comprises a protection fuse 15 whose purpose is to open the circuit when the input current becomes too high (see column 3, lines 66 through column 4, lines 1-17, figure 2 at 15).

Response to Arguments

7. Applicant's arguments filed July 21, 2004, with respect to claims 1, 2 and 6-20 have been considered but they are not persuasive.

With respect to independent claim 6, applicant broadly claims "a light emitting diode circuit comprising: a luminance controller that approximates the luminance change characteristics of a light emitting diode with the luminance change characteristics of a lamp." In applicants remarks applicant argues that there is no teaching or suggestion of this feature. Examiner clearly disagrees because Kanbar teaches <u>an LED lamp</u> and <u>a power transistor activated by a pulse generator to apply D-C pulses to a bank of LEDs, all of which are housed in the lamp, whereby the **screw-in LED lamp** is useable as a **replacement** for a screw-in **incandescent lamp**</u> of a given wattage, yet provides a greater light output at a lower wattage (column 2, lines 22-29). Indeed, the fact that the screw-in LED lamp can be used as a replacement for a screw-in incandescent lamp reads on broad claim 6's features.

With respect to independent claim 1, the claim language reads in part: " a smoothing circuit for smoothing said control pulse to generate a control voltage." Applicant contends that Kanbar fails to teach this feature because the smoothing capacitor in the regulator 21 of Kanbar does not smooth the output of the pulse generator 23. Applicant chooses to read Kanbar narrowly but chooses to write this aspect of claim 1 broadly. Nowhere in applicant's claim 1 does he/she espouse a smoothing circuit that smoothes the <u>output</u> of the control pulse signal. Rather, claim 1 broadly claims a smoothing circuit that smoothes the control pulse to generate a

control voltage. As such, Kanbar reads on this feature by teaching a control pulse generator via pulse generator (23) (figure 4 at 15, 17, 23), and a smoothing circuit via regulator 21 that includes a rectifier, which rectifies the A-C voltage to produce a D-C voltage of the desired magnitude and to maintain this voltage despite fluctuations in the A-C line voltage (column 3, lines 51-56, figure 4 at 21). The regulator 21 is directly connected to the pulse generator and smoothing operation is effectuated by means of the pulse generator 23 receiving a D-C voltage of the desired magnitude to maintain this voltage despite fluctuations in the A-C line voltage.

Furthermore, applicant alleges that Kanbar is designed specifically for a fixed pulse width between 2 and 10 microseconds, and that there is no intent in Kanbar to vary this fixed pulse rate to vary the brightness. Applicant may be reading more into Kanbar than Kanbar actually teaches. Nowhere in Kanbar does he specify a "fixed pulse rate." Rather, Kanbar teaches that to produce light flashes of much greater intensity than is normally yielded by the LEDs without injury to the LEDs, the voltage pulses applied to the LEDs by power transistor 22, when activated by pulse generator 23, are of an extremely short duration, say 2 to 10 microseconds, as shown in FIG. 5 (see column 4, lines 12-17, figure 5). Hence, it is plausible to learn from Kanbar that different pulse would have different pulse durations provided the different pulses fall within the duration of 2-10 microseconds. As such, it appears to be a leap for applicant to **conclude** that there is no intent in Kanbar to vary his fixed pulse rate.

However, Kanbar does not teach a control pulse having a variable duty factor that is adjusted in dependence on the characteristics of the light emitting diode. On the other hand, Hochstein teaches this concept by teaching a circuit for maintaining the luminous intensity of a light emitting diode wherein the control pulse have a variable duty factor (*see* figure 3, column

4, lines 7-17; column 6, lines 3-17) such that pulses of electrical energy are supplied from an adjustable power supply 16 to an LED 12 for establishing electrical current passing through the LED 12; sensing 22,24 a condition proportional to the luminous intensity of the LED 12; and adjusting the electrical energy supplied by the pulses per unit of time to adjust the average of the current passing through the LED 12 to maintain the luminous intensity of the LED 12 at a predetermined level (column 4, lines 19-28, figure 5 at 22).

Thus, it would have been obvious to a person of ordinary skill in the art to combine Kanbar and Hochstein because while Kanbar teaches a light emitting diode (15) driving circuit comprising a control pulse generator (23) (figure 4 at 15, 17, 23), Hochstein teaches how a control pulse having a variable duty factor is adjusted in dependence on the characteristics of the light emitting diode. The motivation for combining these inventions would have been to achieve a robust design that compensates for the diminution of light output from LED signals due to temperature or aging (column 1, lines 9-18; column 2, lines 29-33).

With respect to applicants arguments presented in claims 8-11 and 14-20, Examiner's arguments above also apply.

With respect to claim 12, applicant alleges that Dussereault fails to teach protection against overvoltage fluctuations. Examiner disagrees because Dussereault teaches an embodiment of his invention wherein the controller 10 comprises a protection fuse 15 whose purpose is to open the circuit when the input current becomes too high (see column 3, lines 66 through column 4, lines 1-17, figure 2 at 15).

With respect to claim 13, applicant claims a luminance controller that comprises a minimum voltage generator that prevents a sudden luminance decrease by the light emitting diode. Per the claim language in this claim 13, Dussureault teaches this concept by teaching an LED traffic light intensity controller comprising a controller that detects the output light intensity of a color, and <u>then automatically adjusts the power input for the LEDs in order to increase the light intensity when needed (see Abstract) thereby maintaining the intensity of the LEDs at desired levels (column 3, lines 21-37)</u>. As such, the motivation for combining Kanbar, Hochstein and Dussureault's inventions would have been to maintain the intensity of the LEDs at desired levels (see Dussureault at column 3, lines 21-37).

Conclusion

8. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Uchendu O. Anyaso whose telephone number is (703) 306-5934. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi, can be reached at (703) 305-4713.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist). Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Uchendu O. Anyaso

11/13/2004

CHANH NGUYEN
PRIMARY EXAMINER